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SOAP TOOTH-PASTE GUM TIRES WATER HEATERS

SELLING ARGUMENTS

¶ You buy a certain shaving soap because it comes in a "refill" stick. You buy a certain tooth-paste because it "comes out like a ribbon." You buy a certain chewing gum because it comes "sealed tight, kept right." You buy a certain automobile tire because it is "geared to the road." Comparatively unimportant features all of them, yet effective. Is it a wonder then that Kompak automatic water heaters are enjoying a success the like of which has never been equalled in the sale of gas water heaters? For Kompak has not just one talking point. It has a number, each one a sale clincher in itself. Read on and you will understand why the demand for Kompak automatic water heaters is so universal.

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Safety and the Manager

The Importance of His Support, and How to Get It

By C. W. PRICE
General Manager, National Safety Council

Safety in a plant must begin at the top. The manager and the superintendent must believe in it as a business proposition just as they believe in fire prevention or anything else that prevents waste and increases efficiency. They must give safety a dignified position in the organization, get back of it, and stay back of it so unmistakably that every foreman and workman will know what the officers propose to do to make the plant safe and what they expect the foremen and workmen to do. Without this backing from the manager and the superintendent a safety engineer can do little in reaching the workmen and in awakening the real safety spirit.

How to Convince the Manager

Managers and superintendents do not neglect safety because they are inhuman and indifferent to the welfare of their workmen. It is because they are not informed as to what has been accomplished in accident prevention; they do not know that safety pays good dividends on the investment.

If your manager and superintendent are not interested in accident prevention, or if they do not give you the support you need, your first duty is to convince them by placing before them the experiences of other companies that are doing successful safety work. A manager is always interested in what some other company is doing and the savings which are being made. He must be convinced by hard facts. Here is the experience of six members of the National Safety Council:

The Commonwealth Steel Company, Granite City, Ill., reduced the cost of accidents during the five years ending December, 1918, from $40,000 to about $4,500 per year. During three months in 1918, with 2,500 men, they had no compensation case. They have eliminated eye injuries among the chippers and grinders.

The Eastman Kodak Company, Rochester, N. Y., during the first five years of its safety work reduced lost time through accidents 80 per cent, and reduced the annual cost of accidents from $35,000 to $3,500.

The Omaha plant of the American Smelting & Refining Company, comparing the record of 1916 with 1915, reduced lost time accidents 90 per cent and eliminated deaths. With a thousand men they made a record of running four months without having a man sufficiently injured to cause a loss of over twenty-four hours.

McClintic-Marshall Company, near Pittsburgh, fabricators of structural steel, with a force of 1,050 men, reduced the cost of compensation during 1917 to 12½ cents per $100 pay roll, which is about one-third of the usual insurance premium for a clothing store.

The United States Steel Corporation during the first eleven years of safety work saved 19,815 men from being either killed, permanently crippled, or so seriously injured as to lose over thirty-five days' time. This is in comparison with the record of 1906. In the Gary plant, the South Works, and the Joliet plant (Illinois Steel Company) serious accidents have been reduced over 80 per cent. In the McKeesport plant of the National Tube Company the record of 1916 compared with 1912 showed a reduction of 84 per cent in lost time cases.

The International Harvester Company, with twenty-three plants, including coal mines and a steel plant, as well as foundries, machine shops and woodworking shops, during the first five years of safety work reduced the cost of compensation to 25 cents per $100 pay roll. In their steel plant and several of the largest harvester plants, serious accidents were reduced more than 75 per cent.

It is also important that you place before your manager and superintendent an outline of the methods which these companies use in accomplishing these results. Emphasize the point that at least one-half was accomplished through organization and edu-

We believe the gas industry will welcome this series of articles on Safety, particularly as the series has been prepared by the National Safety Council. The full announcement will be found in the editorial columns. It is hoped that the articles will be found of real value.—Editor.

cational methods.

In presenting your plans for a safety campaign, you must convince the manager that your plan includes the standards used successfully in all companies which are doing efficient safety work.

What the Manager and the Superintendent Can Do

In starting a safety campaign, your manager should outline the plan and state what the company proposes to do to make the plant safe, and what the officers expect of every foreman. The manager should seek to convince the foremen of the practicability of the proposed plan by placing before them the experience of other companies. He should emphasize the point that from this time on safety must be recognized as an indispensable part of an efficient department; a foreman's first duty is the protection of his men. At this meeting the manager should announce regular monthly meetings of the foremen. He should request each foreman to make a rigid inspection of his department and to submit within a week a written report of all points which should be guarded, indicating those which should be considered first.

The company must first do its part—must convince the workmen by visible signs in the form of mechanical guards—before the foremen can go to the men and ask them to co-operate.

After considerable building has been done, and after the manager and superintendent have succeeded in interesting the foremen, then a meeting of all employees should be called. At this meeting the manager and superintendent should speak, and should lay before the men the causes of accidents, emphasizing the point that a large percentage cannot be prevented by anything which the company can do. They should drive home the fact that the workmen are a thousand times more concerned than the company; they may lose their limbs or their lives—the company only loses money.

The manager should announce the new plans for safety work and should place the company and himself on record as willing to do anything possible to protect the men—if they will do their part.

The superintendent should announce the names of the workmen who are to serve on the workmen's inspection committees, and emphasize the importance of their work.

Not only should the manager and the superintendent give the safety campaign their support at the start, but they should actively identify themselves with the movement so that the foremen and workmen will be constantly reminded of their interest.

The superintendent should attend all foremen's meetings, and act as chairman. The manager should frequently attend and express his deep interest in safety.

To keep the manager and superintendent in close touch with the work, the safety engineer should place on their desks each week a brief report covering serious accidents, progress of safety work, and new suggestions. He should do everything within his power to visualize the suffering and consequences of accidents, and their cost in money, to the company. Ask the manager to visit one of the injured men at the hospital and see for himself the horror of accidents. Remember that the manager and the superintendent have many other things to think about; you must make it easy for them to keep informed in regard to your work.

Summary

1. Importance of manager's support.
   - (a) Manager and superintendent must believe in safety as a business proposition.
   - (b) They must give safety a dignified place in the organization.
   - (c) They must let every foreman and workman know what they propose to do and what they expect him to do.
2. How to convince the manager.
   - (a) Managers do not neglect safety because they are inhuman, but because they are not informed as to its value.
   - (b) To convince your manager, tell him what others have done—see typical records on page 1; also get similar records from local plants.
   - (c) Tell your manager methods used by other companies—at least one-half accomplished through organization and education.
   - (d) Tell manager you will use standards used successfully by others.
3. What the manager and the superintendent can do.
   - (a) Manager should call meeting of foremen and subforemen and outline plans for safety work.
   - (b) Company must then start building guards before it can ask men to co-operate.
   - (c) After guard building is started and foremen are interested, call meeting of all employees. Manager and superintendent should speak announcing plans for safety work.
   - (d) Manager and superintendent must remain actively interested in safety. Should receive weekly report from safety engineer or inspector.

An Exception to the Rule

By J. E. DILLON

It is said that time changes all things, but I believe I can show an exception and that is the ways and means of wild-cat stock promoters.

Here is a newspaper clipping dated May 24 1901, just twenty years ago:

"The charters of over 100 oil companies that were organized for prospecting, developing and marketing oil in Texas were declared forfeited the other day by the Secretary of State, John Tod, because they failed to pay the annual franchise tax due the State on May 1. Most of these concerns are capitalized for $200,000 to $500,000. Many are 'wild-cat' corporations that have served their purpose and have gone out of business voluntarily."

Served their purpose, eh?

Yes, got all the money they could, failed to drill and then vanished.

Now about the only change that has been made in the business alluded to is more "change" is passing from E. Z. Mark's pocket to that of these glib-talking, blood-sucking con men who handle worthless oil stocks.

Some Forethought in Gas Engineering

What We Should Strive to Obtain

By E. L. RIEHA, Baltimore, Md.

Last September, when I was approached to prepare a paper, I had intended at that time to confine myself to the description of a new gas-making process, and to follow this up with some suggestions on the development and application of same. But meanwhile references to one or another similar process have come from the gas journals, and I have therefore considered it of greater interest, and possible benefit, to digress from my original plan and present a general trend of thought on the future of gas engineering, which I trust shall awaken renewed effort and stimulate progress in a direction where our manufacturing processes will be altered and developed towards meeting the new conditions in our industry.

In this respect have we been standing still? To a large degree I believe we have, for outside of a few modifications in our present methods we have not advanced very far from the original systems of Murdoch, Clegg, Livesey or Lowe.

Why has this been? And why have we clung so tenaciously to the, so to speak, primitive ideas of these originators?

Has it been because we have in the past enjoyed almost an unlimited supply of the best raw materials for our manufacturing purposes, or has it been, as someone not long ago said, "a case of gout"—too much of the self-satisfied, complacent mood?

It appears to me to have been a case of both. The first being a predisposition to the second, a characteristic which generally follows such a state.

In years gone by we had available high-grade gas coal and good quality gas oil, in quantities and prices that caused us little concern. But the past few years have brought about serious changes in the markets, reflecting most adversely in the manufacturing costs of gas This to the detriment not only of our interests but to those of our customers as well.

At this point allow me to express a thought, which has probably occurred to many of you also, and that pertains to the price regulation of commodities like coal and oil by public service commissions.

Since coal and oil are supplied to even a larger number of users than gas, and both presumably just as essential to the comfort and welfare of the community, I believe it would be to the greater good of the greatest number if these concerns came under a similar regulation as gas companies Many of our difficulties could thereby be more readily surmounted.

Must Make Radical Changes

We are to-day standing upon the threshold of a new era, which calls for radical changes in our methods of manufacture, if we are to keep apace with the needs of the times. And to be able to effect these changes the reprehensible attitude and restrictive policy of present-day gas legislation must, first of all, be repealed.

In a large measure we ourselves are to blame for many of the unreasonable rulings that exist, and which hinder us in our path of progress. I dare say that State regulatory bodies in most instances desire to be fair and render helpful service to the gas company as well as the community. They doubtless, to a large degree, look to us for some enlightenment and intelligent proposal to convince them of the reason and necessity for changing certain so-called standards.

To begin with the proposition, they must be made to feel that they are equally as important in the conservation of our fuel resources as the undertakings that take the coal or oil and convert it into energy.

If we are to be charged with the custodianship of these national resources and be required to obtain the highest efficiency out of a ton of coal, or a gallon of oil, thereby giving the public the most for its money, we cannot attain such service without the aid of those who, to-day, are governing our operations.

No satisfactory results will be secured unless we make the first moves to correct the erroneous opinions about gas standards and proffer our case to the commissions and the public in such a manner as will promptly attest the validity of our claims.

It is our duty to shake off the mantle of uncertainty and timidity and go ahead with firm step, and demand that in the interests of every person in this country, and it devolves upon us jointly to reduce present-day B.t.u. standards, for in this direction alone lies the possibility of bringing down the price of gas to the consumer.

You will say that I have touched upon an ancient topic which has caused us, and the commissions, many vexations of spirit, but it is just for this particular reason that I have selected this subject as the principal theme of my paper.

We all in the gas industry must get together right now and settle this question once and for all time. There is absolutely no reason why we should fail of accomplishment, as we have at hand ample facts and figures to present that gas of a lower heating value is doing equally and more work than one of the present-day standards and that especially such values as are adopted in this section of the country are entirely wrong and wasteful.

We owe it to the commissions, to ourselves, and to the generations that will follow us, to set aside a difficulty which is tearing asunder one of the most important key industries of the nation.

Much good work has already been achieved along these lines, but we are still very far from having reached the best. I mean a gas of such quality that will give the maximum efficiency at the burner and sold at a price commensurate with its heating value.

A paper on the facts regarding gas standards was very ably presented by J. B. Klumpp, chairman of the A. G. A. committee on calorific standards, at the last annual meeting of that association. Another intrepid and complete presentation of the subject was just recently brought before the members of the Missouri and Indiana Gas Associations at their last meet-

*Paper read at Southern Gas Association convention.

ing by Alfred I. Phillips, of the staff of the American Gas Association.

Both of these gentlemen mentioned the possibility of distributing a gas of about 400 B.t.u. per cubic foot for the future.

In this regard I do not hesitate to go a step further and say that it is an absolute necessity to do so and the sooner we get to realize it, the better for all concerned.

Why? Because first of all, we cannot continue to depend upon staple supplies of raw materials. Their cost is getting prohibitive, their availability very difficult and secondly, because we are obligated, as every one must agree, to get the maximum yield from the raw materials which are readily available.

With existing methods and under prevalent regulations this is impossible.

We cannot afford to let this question go unsolved and permit the industry to be overcrowded with difficulties and to drift unprepared and unguided into the problems and contingencies of the future.

It is none too soon to think of the new developments as being those which will be the backbone of the gas industry a few years from now. The great importance of their proper direction is thus at once evident, and it is up to the gas engineers of this country to start the divergence from the old time-worn paths, and lead the way towards advancement and stability.

To begin with, let us ask ourselves a few questions:

Is it a proven fact that 400 B.t.u. gas is as serviceable as one of a higher calorific value?

In distributing a gas of such quality, will it be possible to reduce the cost to the consumer?

How are the gas companies to arrive at this reduction in cost?

What process of manufacture under such conditions would be the one most feasible to adopt?

Let us answer these questions with illustrations of what has been accomplished in England by the British gas undertakings over a working period now covering nearly two years.

Some of you have probably read of the results secured under the new act of Parliament known as the "gas regulation act" which was finally approved Aug. 4, 1920, but as it is the purpose of this paper to present facts and figures, and substantiate them by quoting from actual experience, I crave the kind indulgence of those who are already familiar with the reports.

In the abundance of our raw supplies, we have always been able to demand a specific quality for our coal, our oil, etc., but the war-stricken countries of Europe have been compelled by rulings and restrictions of their Governments to utilize materials for the manufacture of gas which to them, in the beginning, appeared almost like an impossibility. Yet with intensive study, constant perseverance and repeated trials, they have successfully combated all difficulties, and it is from them that we may, at the moment, learn many things for our profit.

On two different occasions, one as far back as July, 1918, the British Government compelled all gas companies to operate on an average standard of 500 B.t.u., before scrubbing the gas, with a minimum standard of 450 B.t.u. The next emergency arose in 1919, during the great railroad strike, when gas of 425 B.t.u. was prescribed.

Minor Disturbances Caused

In the beginning some disturbances were occasioned, but these were only of a minor character and considerably less in extent than was at first anticipated.

At the close of the war it became a question with the authorities whether it would be advisable to continue the distribution of a gas much lower in heating units per cubic foot than usually was customary. The experience of several years' operation along these lines apparently did not seem to satisfy some of the doubting individuals.

In consequence a large amount of accurate work was done in this particular regard by the research and subcommittee of the British Institution of gas engineers, supplemented by a great many separate tests of gas companies and fuel engineers. Men of such ability and prominence in the profession as Professor Arthur Smithells, Professors John W. Cobb and J. B. Cohen, of the University of Leeds, Dr. E. W. Smith and James Wood, of the Birmingham Corporation Gas Department, collaborated in this work, and the results of their findings are decisive and irrevocable.

Experiments on the relative efficency in the use of different grades of gas were made, both with respect to its use in low pressure incandescent burners, as also in radiant fire heaters.

Coal gas lowered in calorific value by the addition of inerts, or by admixture with water gas, has made it possible to state the influence of such additions or admixtures more precisely than has ever before been attempted.

Consideration of low temperature operations, under which may be included water boiling and cooking, was excluded from the report of the research subcommittee. It was confined principally to the study of a lower standard of gas when used in high temperature work.

The service of tests covered a wide range, and were primarily for the purpose of determining what effects nitrogen, carbon-dioxide and air, as diluents, had upon the usual grade of coal gas of 600 B.t.u., and their relative bearing upon the thermal efficiency of such gas mixtures.

To summarize the first portion of this report I will quote as follows:

"In the main, the gases dealt with have been made from straight coal gas, the original calorific value of which has been reduced by other means than modification of the carbonizing process, viz., by the deliberate introduction of inerts. The particular cases of nitrogen, carbon dioxide, and oxygen (in the form of air) have been investigated.

"Equal percentages of these inerts added to straight coal gas exert very different effects upon thermal efficiency in use. Air may be mixed with a straight gas of low inerts to the extent of 20 to 30 per cent of the mixture without reducing in the slightest degree the illuminating power and the thermal efficiency attainable with the incandescent mantle burner, if heat units are supplied at the equivalent rates.

"Air, then, in this proposition is not to be regarded as a harmful constituent of a gas mixture as far as its thermal efficiency in use is concerned. Where nitrogen or carbon-dioxide is added to a straight coal gas

there is a reduction of theoretical flame temperature which might be expected to reduce the attainable illuminating power and thermal efficiency but in practice such factors as flame shape and structure assume so much importance that only when the quantity of inerts becomes large, or when a specially arranged series of mixtures is under test, can the falling off in illuminating power and efficiency be definitely associated with the lowering of theoretical flame temperature. For smaller quantities of inerts and for gas compositions in general, any such effect is masked by other influences. The difficulty of connecting theoretical flame temperature with illuminating power and thermal efficiency is again exemplified by the blue water gas series, where the theoretical flame temperature is higher than for coal gas; but the corresponding higher illuminating powers were not obtained.

"For equal volumes of the inert constituent, carbon-dioxide is much worse than nitrogen. The difference is slightly greater than can be entirely accounted for by the greater specific heat of carbon-dioxide.

"In classifying our results, the standard of performance attained has been taken as satisfactory when the maximum candle power attainable did not fall below 700 candle power, with a thermal efficiency not below 30 candle power per 1,000 B.t.u. net supplied for the "C" sized mantle.

"Mixtures of straight coal gas with nitrogen up to 35 per cent of the mixture satisfy this requirement, while up to 25 per cent of nitrogen the reduction in efficiency, as compared with the original gas in ordinary burners, is of no practical consequence.

"With carbon-dioxide only 10.5 per cent can be added to straight coal gas before the thermal efficiency falls below the limit indicated. Where carbon-dioxide and nitrogen are present together, the limit is determined by their additive effect.

"The difference in influence of the same quantity of an inert constituent according to its nature, whether it is nitrogen, carbon-dioxide or oxygen indicates a limitation in the value of "total inerts" as defining gas quality.

"The above remarks are applied only to straight coal gas diluted with carbon-dioxide, air and nitrogen, over a range of 600 to 300 B.t.u. gross per cubic foot and used for lighting with upright incandescent mantles at ordinary pressures."

It is to be stated here in conjunction with the preceding summary, that with the ordinary burner used in the test the illuminating values and thermal efficiencies were highly satisfactory and fully met the standard proposed with a supply of gas of 343 B.t.u. gross per cubic foot, for the air coal gas series, 350 B.t.u. gross per cubic foot for the nitrogen coal gas mixture, and 443 B.t.u. gross per cubic foot for the carbon-dioxide coal gas mixture. In the latter mixture the CO_2 content of the gas ran as high as 32.2 per cent.

The "C" size mantle and the No. 2 burner which were used in the tests compare closely to the usual types applied in the United States, namely the standard four-inch Welsbach or Reflex No. 107 mantle, and the No. 71 upright Welsbach burner.

The illuminating power in each case was the horizontal illuminating power through the center of the mantle.

It should be borne in mind that some 1,900 to 2,200 B.t.u. net per hour represents the normal heat consumption for the burner.

Only within certain limits approaching closely to the maximum quantities of inerts permissible in the gas mixture, was it found necessary to make new adjustments to the burner. Pressures were maintained at about 2.4 to 2.6 inches

Coming to the second portion of this report dealing with radiant efficiencies of gas fires, the following introduction was to be noted that existing gas fires vary considerably in their ability to adapt themselves to gases of different grades. The evidence obtained so far points to the conclusion that a differences in the grade of composition of the gas supplied within wide limits does not cause any considerable difference in the radiant efficiency of a gas fire, provided that the mechanical construction of the fire will allow sufficient gas to be passed, so that the same number of B.t.u. per hour can be supplied to the radiants.

This statement was fully supported by the more extensive and comprehensive data that had been gathered in a number of tests—at least down to 400 B.t.u. gross per cubic foot, irrespective of the manner in which the quality of the gas had been attained, whether by the admixture of coal gas with inerts or with blue water gas.

Below 400 B.t.u. gross per cubic foot it is hardly justifiable to assert that the thermal efficiency is independent of the composition of the gas for a specified calorific value, but even here the differences are not nearly so great as those met with in the lighting tests.

The report concludes with the following general summary: A series of comparative tests of radiant efficiency has been made with a typical gas fire covering a range of calorific values and gas qualities from 150 to 600 B.t.u. gross per cubic foot.

The mixtures comprised straight coal gas, gas diluted with air, with nitrogen, with carbon-dioxide and with blue water gas—each in a series of mixtures of different proportions; also (as an extreme case) Mond gas was tested.

Excepting for rich gases requiring a large volume of air per cubic foot for their complete combustion, the addition of air down to 350 B.t.u. gross per cubic foot produces no determinate effect on the radiant efficiency in use (and hence presumably upon the total thermal efficiency also). The inclusion of air among the "total inerts," when considering thermal efficiency in use, is therefore misleading.

Nitrogen may be added to good coal gas to the extent of 20 per cent, thereby reducing the calorific value to 500 B.t.u. gross, without affecting the radiant efficiency to any measurable extent.

The fall in radiant efficiency with further dilution is very slow; and even when the calorific value is reduced 300 B.t.u. gross and the maximum radiant efficiency only falls from 44 to 40 per cent on the gross calorific value. (At 400 B.t.u. the drop is only to 42 per cent.)

This fall is actually less than that experienced with rich coal gas (530 B.t.u. gross and upwards) due to imperfect aeration, and is little greater than the variations in radiant efficiency with any one gas which accompany ordinary alterations in the rate of its use.

The carbon-dioxide has more effect than nitrogen as a diluent, volume for volume, but need not be sep-

(*Continued on page* 520.)

Early History of the Gas Industry*

Developments in Manufacture of Wrought-Iron Pipe for Gas

By ROY B. VERDERY, Atlanta, Ga.

Natural Gas

Natural gas was known to exist in Persia, China and British India for many centuries, although it was never put to commercial use. It appeared as leakage from gas-bearing strata through crevices in the ground, and when lighted by the natives it was worshipped as a "fire god." A Mr. T. Shirley in 1669 attributed a burning well at Wigan, England, to the presence of coal underneath it. In this country as early as 1775 George Washington dedicated to his country, as a national park, a tract of land which he had pre-empted, located in West Virginia, containing a burning spring. This, too, was leakage from a crevice in the ground. The first discovery of natural gas by drilling occurred through the sinking of shallow wells for salt in Ohio and West Virginia, but the first actual use of natural gas for light occurred in Fredonia, N. Y., in 1826.

In 1872 Titusville, Pa., was piped for natural gas for domestic purposes, being supplied through a 2-in. main from the Newton well, about five miles north of Titusville.

Artificial Gas

The producing of gas by the distilling of coal is known to have been accomplished by a Mr. Clayton as early as 1669, although to William Murdock, of England, must be given credit as the inventor of coal gas and artificial gas lighting. He illuminated his house with gas lights in 1792, and a very poor show it is said to have been. In 1802 Birmingham, in celebration of the peace of Amiens, brightened up a large factory with gas light. Thousands journeyed to see the wonderful sight—which led to gas works being established at that place, and in Manchester and Halifax. In 1807 a German by the name of Winsor succeeded in lighting up one side of Pall Mall with gas.

In the year of 1810 the Gas Light & Coke Company, of London, was incorporated and applied for a charter. Mr. Murdock, as the inventor of coal gas, was connected with this company, and he and his associates were subjected to considerable ridicule when first application was made before the House of Parliament. Sir Walter Scott made various smart jokes about the absurdity of lighting London with smoke. People implicitly believed that the gas was carried through the pipes on fire, and they foresaw awful results from red-hot metal. Almost three years elapsed before the charter was granted.

Early Gas Mains

Murdock used old gun barrels (of which there was an abundant supply at the close of the various European wars), screwing the barrels together into a continuous tube to convey the gas. This marked the first use of pipe for gas lines. The extension of gas lighting was very rapid and the necessity for production of iron tubes with greater facility and less cost became apparent. About the time of Murdock's invention of gas another Englishman, named Osborn, patented machinery for "welding and making barrels of firearms and other cylindrical articles." His method is believed to have been the earliest form of machinery for welding iron tubes. The process was not very rapid and the newly organized gas companies created a demand for tubes that could be made with greater facility and less cost. The inventors were equal to the occasion, and in 1824 James Russel, of England, made the first butt-welded pipe. His method was improved upon one year later by Cornelius Whitehouse, whose process of drawing the skelp through a pair of bell-shaped dies forms the basis of the present butt-weld process. The Whitehouse invention not only reduced the price of iron tubes but supplied a far superior article.

American Progress

The demand for tubular products in America for artificial gas, tubes for boilers, water supply systems and numerous other conditions, caused the firm of Morris, Tasker & Morris to undertake the building of the first furnace for making butt-weld pipe in the United States. This furnace was located in the cellar of a shop at Third and Walnut Streets, Philadelphia, the welder being William Griffeths, who had followed that trade in England. To-day there are fifty-five butt-weld furnaces in this country, with a capacity of approximately 1,000,000 tons per year.

Naturally, the earlier methods were cumbersome and slow by contrast with means later employed. A fixed slotted die was the first improvement over the original two-part die. A strip of iron was heated once, drawn through this die, was then reheated and drawn through a pair of funnel-jawed welding tongs. A piece of round iron bar (the tag) was welded to one end of skelp. This bar had a knob on the end that engaged to a buggy which the operator also engaged to a draw-bench chain.

Later Improvements

By combining the bending and welding of skelp into one operation, George Matheson, of McKeesport, Pa., patented on March 25, 1875, a funnel-shaped bell and a fixed bell holder slotted at the top. This device materially decreased the cost and increased the production. The elimination of the welded round iron bar on each piece of skelp was accomplished about 1895, when a variety of pipe-drawing tools and tongs came into use. The tongs were so designed as to pass through the funnel-shaped welding bell and grasp the pointed and upturned end of the skelp in the welding furnace, and then engage to the chain of the drawbench. Greater production and more uniform work resulted. Up to this time the skelp was charged and drawn from same end of furnace, and the next improvement consisted in charging the furnace from back end through a horizontal slot extending its full width. A cold piece, being charged as a hot one, was drawn and all parts of skelp

*Paper read at Southern Gas Association convention.

were in the furnace the same length of time. Peter Patterson, of McKeesport, Pa., patented this system on April 20, 1897. Charging machine electrically driven now does away with considerable laborious work.

Starting with a few feet in length to a standard length of 20 feet, the next step was to build a 40-ft. furnace, the first of which was put into operation at McKeesport, Pa., in 1901, and was entirely successful. Forty-foot lengths up to and including 3-in. pipe are usually furnished for use in laying welded gas mains.

Materals for Pipe

Wrought iron was universally used for welded pipe and other welding operations prior to 1888. A more uniform and more economical material for pipe manufacture was demanded, which led to experiments in the use of Bessemer steel for this purpose at the old Riverside (W. Va.) Iron Works. Open-hearth steel is now sometimes resorted to, but the welding quality is more difficult to control. The use of steel pipe steadily increased, and to-day forms over 90 per cent of the entire production of wrought pipe. Through the incorporation of complete plants wherein the pipe is made complete from iron ore to finished product, a more uniform product and increased production is obtained.

First Radical Change in Manufacture

Practically all of the work in rolling the ingot into skelp is naturally done lengthwise. To produce a more uniform and durable product the first radical change in manufacture was the introduction of a knobbled roll to laterally work the bloom while it was being elongated and reduced in section. This process is known to the trade as "Spellerizing," and gives to the metal a very dense and uniform nature, which better enables it to retard corrosive actions.

The usual method of finishing pipe is to give it one pass through a circular sizing roll, then through straightening rolls of helical section and on to a slow moving cooling table. A rather heavy mill scale forms on skelp while in the heating furnace at the welding temperature. At this temperature it is fluid, consisting mostly of iron oxides from the furnace bottom, and acts as a natural flux for welding, also protecting the metal from excessive oxidation from the furnace gases. It is therefore a very essential factor in pipe welding; so much so that pipe steel is made primarily so that it will be self-fluxing by readily forming this fluid oxide at as low a temperature as possible. The melting of the welding scale gives the welder a quick indication of the temperature of the skelp, which is much better than any device for heat measurement. On cooling, the welding scale passes through a viscous stage and then quickly becomes brittle at a temperature at which the steel is quite easy to forge. Most of the scale on the outside is removed in the sizing and straightening rolls, but inside the pipe this scale is often one thirty-second or one-sixteenth of an inch thick in patches, and when cold is firmly attached to the metal like an enamel. Several means have been used to remove this scale to prepare the pipe for galvanizing and other coating operations. Pickling in acid is the most common method employed but is the least effective on the inside of pipe, where the scale is most firmly attached; and, further, as the scale is very irregular and rather thick in spots, portions of the metal are likely to be damaged by overpickling before all the metal is cleaned. Mechanical cleaning by sand-blasting and cold-rolling has been tried, but has not been thorough enough, besides being quite costly.

By making the diameter of the pipe larger and then reducing the size and elongating the pipe at the highest temperature at which the scale is brittle enough to remove, it has been found possible to clean the pipe in the process of hot-finishing and at the same time produce a better material in other respects.

This new process consists of two additional steps other than regular methods: (1) A partial cooling of the pipe from 2,500 to 1,800 deg. Fahr.; (2) a reduction in diameter and elongation of about 10 per cent in length by means of a series of horizontal and vertical rolls, by which the brittle scale is cracked and separated from the steel. The pipe is then straightened and cooled as usual, during which a thin film of new oxide forms sufficient to protect the metal from rusting while being handled. A thin coating of suitable lacquer is now applied, which affords substantial protection to the pipe in storage. The main object of these scale-removing and cleaning operations is to make possible more uniform galvanizing. This also has an important bearing on the manufacture of all kinds of coated pipe and conduit for electrical purposes.

The scale-free surface rusts much more uniformly than when covered with the heavy mill scale, as there is quite an appreciable current generated between mill scale and iron, which results in pitting of the metal. For this reason it is usually of advantage to have the scale removed, especially where the pipe is buried in the ground or subject to other active corrosive influences. The fact that mill scale is usually the controlling factor with respect to pitting of iron and steel has been demonstrated by several other investigators besides ourselves. Some tests made in hot-water service at Harvard University recently, covering a period of three years, indicate that this scale-free pipe was pitted to little more than half the depth of the pitting found on the regular wrought-iron and steel pipe used for comparisons in this test. It may be said, as a rule, that the more perfectly the surface is cleaned the more uniform will be the corrosion. This is the reason that such care is desirable in the removal of scale and dirt before painting iron or steel. The scale-removing process described was first developed in 1913 and has recently been put into general use in the butt-welding mills of a large manufacturer.

Brooklyn Union Gas to Cut Its Rate to $1.25

William A. Prendergast, chairman of the Public Service Commission, has announced that the Brooklyn Union Gas Company has indicated its intention of reducing its rate from $1.50 to $1.25 per thousand cubic feet, effective August 1. The reduction is based on lower prices to be paid for gas oil.

Mr. Prendergast said the reduction would not affect the hearings on the general gas situation, which are to begin before the commission June 16.

That the announcement was made by Chairman Prendergast, rather than the company, gave such grave concern to John P. O'Brien, corporation counsel, who has directed the city's fights against the gas companies, that he issued a statement of several thousand words, the gist of which was that Mr. Prendergast was seeking glory for his commission which belonged to Mayor Hylan.

Automatic Control*

One Operator Can Now Handle Two Machines Easily

By S. A. GOODMAN, Norfolk, Va.

At the close of the war we, in Norfolk, after a hard struggle to maintain service for a population that had increased during the war period from 70,000 to 300,000, found ourselves on rock-bottom. During this entire period we were unable to close down any portion of our plant for alterations or repairs; it was one long, hard struggle to keep holders afloat. We were then making a combination of coal and water gas, and at the time of signing the armistice our boilers, benches and water-gas sets were all in a hopeless condition. We had, however, for some time previously been preparing to meet the situation; contracts had been let for many new appliances of increased capacity, among which was a 11-in. Lowe water-gas set with automatic control, together with the installation of a waste-heat boiler. It is of the latter two appliances that I propose speaking, as they are together responsible for the excellent results obtained.

Contrary to our expectations, our increases in output do not necessitate the operation of a second machine. We are, therefore, not in a position to describe the maximum of economics to be obtained. I might state, however, that the one operator now at work could readily, with the automatic control, handle two machines and possibly a third. I am of the opinion, however, that the third machine would entail an unjustifiable hardship and the operator could not alone keep in as close touch with three sets to insure the maximum efficiency in the operation of one 11-ft. set, although we find the automatic control gives us much closer regulation and enables us to operate on a much shorter cycle. The cycle of the hand-controlled machine is absolutely an unknown regulation. On a seven-minute cycle you are just as likely to get a six or eight minute as you are on the seven. However, with the automatic control there is an absolute certainty of obtaining just that cycle for which you set your machine. We are at present running on 5¾-minute cycle and, by reason of the shortness and regularity of said cycle, are obtaining a perfectly uniform condition throughout the operation, with but very slight differences in quantity or quality during the different periods of checking, and no differences observable on change of operators between shifts, as is so often noticeable on hand-control.

With the one 11-ft. set our increased efficiency throughout will average 15 per cent, giving us a coke reduction of 1.5 pounds per thousand and oil 0.13 gallon per thousand, and during operation of the machine its waste heat practically takes care of our steam requirements for gas production.

The control itself consists of one small ¼-in. horsepower motor, direct connected to a reduction gear box, where the final gear, running at a given speed, connects to another set of gears or gear-shift to give the required cycle for operation, namely: 4½, 5¼, 5¾ or 6¼ minutes. These gears operate cam shafts; the cams are adjustable to allow the closest regulation of the blast oil steam and stack valves, each of which has a hydraulic cylinder direct-connected for its operation by a set of Critchlow valves, which, in turn, are operated by pilot valves in the control cabinet, except the oil valve, which is operated directly by one of these pilot valves. Therefore, with these pilot valves being operated at a given speed, our length of blow and run can be kept constant, the proportions being regulated to the most economical point of efficiency, which is practically impossible by hand operation.

The Signal System

The signal light system or electric alarm system consists of an extensive electric wiring switch and light installation, which is flashed by lights into a glass-front box, partitioned into compartments, showing the relative on and off positions of the valves operating the machine.

There is also a relay system operating a gong, which rings in case the valves do not operate correctly.

With automatic control you are practically independent of the skilled labor situation, as any man with ordinary intelligence can, with but little tuition, successfully handle the apparatus.

The signal light system I consider an unnecessary expense, and feel that the operations would progress without their use, our operators very seldom glancing at them. Some operators, however, particularly if operating two or more machines, may possibly more fully than I appreciate the advantage of this addition, but I am of the opinion they could be dispensed with.

I would add further that even greater savings could be effected in a number of plants with the automatic control over their present results, as we were, before the controls were installed, running very close on the theoretical amounts of oil and coke per thousand, and would hesitate to say, for the benefit of fellow members, that with at least fifteen operating hours on a Lowe carbureted water-gas machine in good condition you could operate with an average of 30 pounds generator fuel and 3.2 gallons of oil on a 580 B.t.u. basis one mile from the works.

*Paper read at Southern Gas Association convention.

Alphonso Mason

Alphonso Mason, long connected with the Welsbach Company, died June 7 at his home in Washington, D. C. He was 77 years old. The funeral took place in Philadelphia on June 9. Interment was private.

Mr. Mason attended the recent Natural Gas Association convention in Cincinnati, where he was stricken with the illness that proved fatal. He was removed to his home when he was able to travel, but did not respond to treatment. He was ill three weeks.

Mr. Mason had been active in the gas industry for many years and was widely known. He numbered among his friends many of the leaders of our field who expressed keen regret on learning of his death.

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As the Journal Views It

Editorial Announcement

The AMERICAN GAS JOURNAL is pleased to announce the consummation of an arrangement with the National Safety Council whereby that organization will conduct a special safety department for the AMERICAN GAS JOURNAL, starting in the present issue. Through this arrangement the AMERICAN GAS JOURNAL will be enabled to publish once a month a special article on some phase of safety or its allied subjects applicable to the gas industry.

This arrangement makes available to the readers of the AMERICAN GAS JOURNAL in large measure the valuable service of the National Safety Council—the nation's clearing-house for information on statistics, methods and experiences in accident prevention, sanitation and industrial health work. Inasmuch as the National Safety Council is a non-commercial, co-operative association of some four thousand of the country's largest industrial concerns, governmental agencies, technical schools, etc., membership includes the great bulk of the safety engineering knowledge and talent of the United States.

During the next twelve months the AMERICAN GAS JOURNAL will publish articles prepared by the National Safety Council on many subjects.

Meeting Propaganda

In a recent issue of one of the popular weekly magazines there appeared an article setting forth all of the comforts and advantages of a "servantless home." The entire article was based on the electrically equipped apartment idea, and a casual reading would seem to show that once electricity is installed in a house or an

apartment that all of the woes of the housewife are eliminated and work is abolished. In fact, one would gather that housekeeping under those conditions becomes simply a question of knowing which button to press. The impression that remained with the cursory reader is that cooks and maids are going and that from this time on the only person needed in the home would be an electrician.

But that isn't all of the story by any manner of means. Going over the advertising pages of the periodical we found advertisements from gas-consuming appliance manufacturers advocating the use of their particular article. Now, we don't say that the editorial department should be governed by the advertising man. In fact, we lean the other way and are jealous of the prerogatives of editors in general and ourself in particular. We haven't been and won't be guided in our judgment by the advertising department's request. We couldn't do it and hold our readers. But we do make this point: if a policy has been established by a magazine, then that policy should apply to every column, and certainly any magazine that so openly is against gas in every form should not try to get the support of gas men.

But, after all, this is only a small part of the story. The article as published is simply another evidence of the enterprise of the electric industry, and we certainly admire energy even if it is directed against us. It remains, however, for the gas industry to show the same great enthusiasm for our product and to boost as we never have boosted. For, after all, we all know of the tremendous advantages of gas over any other kind of fuel. But let's see if we believe enough in ourselves to push forward with the vigor that we should.

Another example of the alertness of the electric industry: We have been in numerous cities recently and in most cases have been fortunate enough to visit homes. Now, we have found in over 90 per cent of the homes visited that the electric companies have secured a foothold or at least a hearing for themselves. And it has been a simple method used, too. They have placed in the hands of the citizens of those communities cleverly prepared and beautifully printed booklets that tell the story of electricity and make a plea for support. And the booklets have had a hearing, of that we can vouch.

The gas industry has a similar opportunity right now. Will the industry avail itself of this privilege, or will it fail? The booklets have been prepared and are ready, and they more than equal anything turned out by the electric industry. Will the gas companies use them? Only the next few weeks will tell.

Voting on Municipal Ownership

The following editorial, taken from the *Hudson Observer* of Jersey City, N. J., tells its own story and needs no explanation from the AMERICAN GAS JOURNAL. As a matter of fact, no criticism that might be offered would avail. The politicians of New Jersey have decided that additional patronage is necessary, and this looks as if it might be the source of many lucrative jobs for the party in power.

There is just one thing that might be said about the editorial attached hereto. The tone of it gives the idea that municipal ownership of gas plants is prevalent in the Western States and that practically all gas plants are so owned and operated in that part of the country. Of course, this is qualified by stating that no city of the size of Jersey City has ever attempted this method of operation.

The only thing that can be added is the hope that the voters of Jersey City will be educated to the real facts of municipal ownership. The editorial follows:

WHY ESTABLISH A GAS PLANT ALONE? WHY NOT ELECTRICITY TOO?

The die is cast and Jersey City voters are to have the opportunity to pass upon the question of the erection and operation of a municipal gas plant at the November election. There is no reason why a municipality which successfully provides water for its inhabitants cannot do equally well with a gas supply. Both are business and engineering undertakings which will prosper exactly in proportion as politics are kept out of the management.

The Jersey City experiment, if authorized by the people, will be watched with interest the country over, for it is doubtful if there is any city of its size in the country which has adopted this method of solving its lighting difficulties, although in numerous smaller places such works have been in more or less successful operation for many years.

The idea, which is almost universally prevalent in Great Britain and on the Continent, has taken greater hold in the West than in the eastern part of the United States, and the great majority of such plants are to be found to-day west of the Alleghenies. A progressive and intelligent government such as Jersey City is possessed of can hardly fail to make at least a sufficient success of the enterprise to justify the attempt.

While the Jersey City authorities are about it, why not start a combination plant—gas and electricity? That matter should be threshed out before it is submitted to the voters.

Gas Company Denies Charge in Suit

Hamilton, Ohio.—Denial of the charges made in the petition of Earl Lloyd of Middletown in his $10,000 damage suit is made in the answer filed in common pleas court by the Ohio Gas & Electric Company. The answer denies that they had strung a cable across the highway not higher than 8 or 10 ft. and that Lloyd was injured as he says on Jan. 3, 1912.

The Necessity of a Commercial Department*

It Is a Buffer Between Company and Consumer

By A. F. TIMBERLAKE, Greenville, S. C.

This is a much-haggled subject. There have been papers read at every convention since there have been conventions, written by new-business men telling their bosses how they could hold their jobs. It is no longer necessary for us to write this kind of a paper, for at this time especially this is the most vital subject that confronts the gas companies. Appliance stores and agencies for gas-burning appliances have sprung up all over the country, run by business men on a progressive business basis, who are getting a portion of the profits derived from appliance sales that rightfully belong to the gas company but can only be obtained through a live, competitive new-business department.

Gas Companies Receive Higher Rates

Most of the gas companies have gotten an increase in gas rates, and it will be necessary to maintain these rates for some time to come to repay the gas companies for the period that they have sold gas at a loss, hoping for a decrease in manufacturing cost so that they could furnish gas at the old rates and still at a margin of profit. These rates are no higher comparatively than they were seven years ago, considering the purchasing power of a dollar in 1914 and now. To maintain these rates and to keep up the present output of gas is the business of the new-business department, not in a combative pay-it-or-else way but in friendly personal contact with the consumer.

We are now facing a period similar to that some ten years ago, when gas was just a little higher than other fuel and it was the duty of the new-business department to educate the public to the convenience, cleanliness and other qualities of gas service. This could only be brought about by personal contact with the consumer, and resulted in every gas company having a new-business department.

The new-business department is a buffer between the public and the gas management. It is the right hand of the gas company extended to the public, and is as far as the acquaintance of 80 per cent of your consumers goes with the gas company. It must be made up of men of pleasing personality to the public as well as men of ability to handle not alone sales but the many problems that serving the public entail. To use gas for every purpose possible and to be willing to pay more for it because he realizes the high quality of service rendered him is worth more would be the ideal gas consumer.

Can we sit in our offices and expect the appliance store man and his force of appliance salesmen to create this attitude toward the gas company? Can we expect the consumer to know just what gas service means to him, without coming in contact with him? In this capacity a new-business department is invaluable. The new-business man must first gain the confidence of the customer before he can sell him an appliance. To do this he must first convince the prospective consumer that he will receive fair treatment at the hands of the company. No better medium of good-will advertising can be devised than that obtained through a live new-business department.

Don't you like a chap who has something to say and knows how to say it? We do, and that is one reason why we like Mr. Timberlake's paper. It is clean-cut and concise, and we know that it will be found of real interest.—Editor.

The Following Are Offered as Suggestions

The new-business department should be made up of men with gas company training; men thoroughly acquainted with all kinds of gas appliances who are able to understand a customer's wants and to sell him an appliance that will give him the most satisfactory service. The new-business man should know the manufacture of the best appliances and know who makes an appliance suitable for every requirement. No salesman should ever sell an appliance until he is thoroughly convinced that it is the very best of its kind to be had. The salesman should be taught everything possible about an appliance: the consumption, efficiency and adaptability to different uses. Without this no new-business department can be a success.

Advertising

The main object of a commercial department is, of course, new business. To this end it must have the cooperation of all the other branches of the gas company; and especially in the larger companies that of the advertising department, and in the smaller ones an ample allowance for advertising. In an address to the retail merchants of Atlanta Charles F. Sanders, the noted selling expert of Chicago, said: "Advertising pays for itself." Advertising creates immense markets. It en-

*Paper read at Southern Gas Association convention.

ables the manufacturer to buy in tremendous quantities at lower prices. It makes him put better quality in his goods. It lets him produce more products at the same overhead expense, which means a lower cost for each article. The manufacturer can thus sell his standardized products cheaper to the retailer. The retailer gets lower priced goods, better quality, known products. He can accordingly sell his customers at lower prices; they in turn get cheaper, better products. Neither the manufacturer, the retailer nor the consumer pays for advertising; it pays for itself.

Profit comes from turn-overs, not left-overs. If the gas companies will remember this, and that the only real good-will advertising can be gotten through personal contact, when they make their advertising allowance there will be fewer left-overs and more profits.

Co-operation of the different departments should be carried out to the fullest extent. And that of the fitting and new-business departments should be very close. A very good arrangement would be to have the fitting department under the supervision of the new-business manager, who comes in contact with the customer and knows when installation should be made on short notice and when special attention should be given a certain job to either gain a big consumer or hold a good old one. I have known of cases where gas companies have lost some splendid consumers that could be traced directly to lack of co-operation between the shop and new-business department. The salesman loses his prestige with a customer when he has to go to the shop foreman before he can promise an installation. This could very easily be handled by the new-business manager if he were constantly in touch with the shop department.

New Business Department Should Show Profits

The new-business department should be run on a progressive business basis, and should not alone be self-sustaining but show a reasonable profit. There is no good, sound business reason that will excuse a company for allowing its gas sales to show a loss resulting from the sale of appliances. The gas company's prime interest is to increase its gas sales on its existing mains with as little expense as possible. It is, therefore, of vital interest to the company to see that its consumers have the best appliances possible. The gas company cannot sell them all. There is a demand made on the appliance dealer for them, and he will be unable to carry a satisfactory appliance if the gas company has put the price so low that he is unable to compete with a standard article. Putting your commercial department on a profit-making basis will not only show a gain to the gas company but will make friends among the dealers and enable them to carry an appliance that you will be glad to see go on your mains.

The gas company should co-operate with the dealer in every way possible and give him the benefit of your new-business department's gas company training in selecting his line of appliances. And be as much help as possible in getting his appliances installed for him. In this way the dealer can be made a great asset in building up your gas output, with no expense and very little trouble on the gas company's part

Substantial Pay to Salesmen

Almost every gas company has a different method of paying new-business men, but every company expects the same results. These results can only be obtained when the commercial department is made up of men of the highest type obtainable. These men are hard to get, and demand substantial pay for their services. This is most satisfactorily handled by adding a certain per cent to the price of appliances to cover salesmen's salaries and by working your salesmen on a salary-and-commission basis.

Let me take this opportunity to say that no gas company should attempt to have a cheap new-business department. If it is not worth paying the price of men that truly represent the gas company it is not worth having.

The new-business man should be paid enough to insure the gas company that men of ability would choose this line of work, and that as soon as they had become trained in selling gas appliances they would not be hunting something else to do what is more remunerative. The new-business man comes in contact with the better people in your community, and must be paid enough to meet them outside of business hours on a friendly equality if the desired result is to be obtained from a new-business department.

It would be very hard to estimate the good that a new-business department does a gas company that is never shown on the company's books. This is the good-will and friendly feeling toward the gas company created by the friendly rubbing of shoulders with the public. It has been said by some of the shrewdest men in the gas game that a new-business department would more than pay for itself if it never actually took an order in good-will and friendship created through this personal contact with the consumer.

At the beginning I stated that this is a well-haggled subject. I have tried to bring out the points of most interest as I see them, and to offer suggestions that occur to me in considering the necessity of a new-business department. The only way in which I can hope to leave my points clear is to leave the subject with you without further haggling. I hope that this paper will be received in the spirit in which it was written.

Some Forethought in Gas Engineering

(*Continued from page* 513.)

arately considered unless its volume is large—say, greater than 5 per cent

Blue water gas mixtures show a slight increase in radiant efficiency as the proportion of blue water gas in the mixture rises.

Good blue water gas by itself gives a high efficiency; but inasmuch as the principal inert in the poorer grades is liable to be carbon-dioxide, a fairly rapid drop in efficiency is experienced as the calorific value falls below 320 B.t.u. gross.

An efficiency of 36 per cent on the gross calorific value was obtained with Mond gas containing approximately 60 per cent of incombustibles, of which 15 per cent was carbon-dioxide.

This represents only about 80 per cent of the useful thermal output of coal gas or blue water gas mixtures.

In conclusion, it is to be pointed out that while inerts have thus far been shown to exert measurable effects upon the thermal efficiency of the gas fire, these effects are relatively small, and for any mixture down to 350 B.t.u. gross per cubic foot thermal equivalence in practice may be assumed.

It is appropriate to state here that a plain ten-inch

fire was selected, flat fronted, and simple in the design of its casting; so that no abnormal distribution of the radiant energy was encountered. The burner tips were of uniform size across the whole width of the fire and not graduated as is sometimes the case. A normal type of columnar radiant was employed. The injector supplied was of the sliding type and sufficed for all tests down to 300 B.t.u. gross per cubic foot, with the ordinary means of adjustment provided by the makers. For Mond gas, however, of 140 to 150 B.t.u. gross per cubic foot a special temporary injector was fitted.

The fire was supplied with gas from a twenty-light meter through a short three-quarter-inch service and a pressure of 32 tenths at the inlet of the meter was available. The pressure at the inlet of the injector was regulated to 20 tenths, except in a few cases where it was increased to 30 tenths when reaching the maximum introduction of certain inerts.

These pressures were maintained when the fire was in operation even at the highest gas rate employed, and are therfore not the static pressures at the inlet of the injector.

A typical curve obtained by plotting radiant efficiency against the hourly rate of heat supply showed that the maximum efficiency was evidently reached in the neighborhood of 13,000 B.t.u. gross per hour. A 10 per cent variation either way was barely perceptible.

In confirmation of these points, certain earlier tests were repeated after five months of almost daily use of the heater with substantially the same results.

Radiant Efficiency Only Dealt With

It should be observed that throughout this report, as in the earlier one, the radiant efficiency only is dealt with, and the whole value of the gas fire as a heating agent was not to be implied in any of the trials.

As a matter of fact, to allow for "convected heat" the values given for radiant efficiency must be increased by something like 50 per cent so that the value of 44 per cent given as the radiant efficiency of a certain gas on its gross calorific power must be increased to approximately 66 per cent to obtain a fair estimate of its total thermal efficiency, when used in such type heaters.

As this latest report deals principally with the use of gas of a low calorific value in incandescent burners and radiant fire heaters, you probably will be interested to know something about such gas applied for cooking and water heating.

It has been asserted by some engineers that lowering of the calorific value of the gas causes a proportional increase in the amount of gas consumed. This theory does not hold good with water heating and cooking appliances.

Better Results Obtained

Under similar pressures, with burners adjusted to suit, it has been demonstrated that a lower grade gas would give the better results.

In one test a gas of 600 B.t.u. required 1,793 heat units to boil a quart of water, while a 450-B.t.u. gas needed only 1,516 heat units. In another test a 593-B.t.u. gas required 1,726 heat units and a 441-B.t.u gas only 1,521 heat units. In a later third test a 565-B.t.u. gas required 1,714 heat units and a 422-B.t.u gas only 1,551 heat units.

You will have learned from the foregoing accounts that ample evidence is at hand to justify the distribution of a lower B.t.u. gas than is now the practice, and that same can be done with a larger proportion of inerts or diluents than has heretofore been accepted as advisable and that actual tests have proven there is no lowering of efficiency of the gas to the consumer.

In abstracting a report of this character, one cannot pass on without expressing apology to the authors for its inadequacy, and commending to your careful reading the entire paper which handled the situation so ably and completely.

Reducing Cost to Consumer

We have now approached the second question: "Will it be possible to reduce the cost of such a gas to the consumer?"

Taking all things into consideration, that such grade gas would allow the gas companies to purchase raw materials in a much wider market than at present, that the yield of gas per ton of coal could be vastly increased over present methods, and that attendant with this would come a much greater producton per man per day, and again, that the capital cost for the machinery would be reduced proportionately to its increased capacity, I believe we can respond to this question in the affirmative.

At this juncture it may be well to treat the above question with question number three as both bear close relation to each other, and can probably be answered together to better advantage.

First of all, the purchasing of coal located nearer to the plants will cause some saving in the cost of the product. There will be a greater variety to choose from, and competition should be made keener with the widening of these sources of supply.

It must, however, be borne in mind that where there is too great a difference in quality, the relative costs of obtainable B.t.u. per ton and the added requirements for gas purification must be compared before rendering a decision.

On the yield of gas per ton of coal we surely can improve over present methods. The usual carbonizing process in horizontal or inclined retorts without steaming never gave much over 11,000 to 12,000 cu. ft. per ton in ideal operation. Modern vertical retort settings or chambers have been operated with an introduction of steam during the latter period of the charge, in some instances as soon as the contents of the retort or chamber were sufficiently incandescent to permit the use of steam for increasing the yields.

These methods of operation have proven satisfactory up to 15,000 to 16,000 cu. ft. per net ton. Any increases beyond these figures were attended with a rapid falling off in heats and an increase in generator fuel which made further efficiency doubtful. Yet with a lower grade of gas, there are possibilities where these limits can be materially extended.

But since we are advocating a 400-B.t.u. gas for distribution, why should we stop at this stage, when the highest economy and efficiency still lie ahead of us?

A ton of coal contains about 30,000,000 B.t.u. from which, under our present systems, we realize only

about 6,000,000 to 7,500,000 B.t.u. in the gas, or an efficiency of 20 to 25 per cent.

Now, is there some way by which we can approach nearer to a more perfect utilization of the coal by increasing the yield of B.t.u. so as to effect economies that will insure us the opportunity to reduce the costs of production?

Complete Gasification of Coal

Not only is there a way possible, but I will endeavor, in answering the final question, to bring to your attention a method that has not only been tried out, but has been successfully adopted in quite a large number of gas plants in England and on the Continent of Europe—namely, the complete gasification of coal.

Gas plants, you will doubtless concede, should essentially be gas generating stations. Of necessity, in years past, we were obliged to handle coke, tar, etc., as by-products. Only in certain localities, and when the markets were favorable, could these by-products be disposed of to an advantage.

It has been the gasman who, in late years, has been so strongly advocating the substitution of gaseous fuel instead of solid fuel for domestic heating and industrial operations, but always has he been confronted with the problem of producing such a commodity at a low enough price to make it attractive from every viewpoint.

With few exceptions, this difficulty prevented the application of gaseous fuel more universally.

With complete gasification and recovering 70 to 80 per cent of the efficiency of the coal in the form of heat units, there can be but little reason to doubt that our industry is standing on the threshold of immense development. The many advantages of gaseous fuel have been so frequently discussed that it is hardly necessary to touch upon them here at any great length.

The ability to regulate furnace operations to the desired temperatures, resulting in increased output, greater bulk handled per man per unit of time, reducing superficial foot of factory area, and thereby saving in capital expenditure, are only a few of the benefits derived, not to forget to mention the cleanliness, the healthier surroundings of the workmen, and as a matter of fact, improving living conditions in general.

The cycle of business depression will soon revert to one of prosperity, and it behooves us to be ready to meet the larger and sudden demands that will be made upon the gas industry.

Inasmuch as the idea of complete gasification of coal has already been periodically discussed by the technical press, and since we are to deal with some facts and figures on this subject, we will immediately proceed to examine what really has been accomplished abroad.

With several systems now in operation, it is possible to recover 22,500,000 heat units per ton, or get an efficiency of 75 per cent of the coal in the form of gas of 400 B.t.u. per cubic foot. This means an increase of 300 per cent over most of the present-day processes of gas making.

This is surely something worth investigating in these times, for what does it mean?

It is that, combined with the greater efficiency of gas appliances than coal appliances, the economy, efficiency and labor-saving of gas would put coal out of the running in competition for domestic purposes. Take a coal of a value per ton of 30,000,000 B.t.u. and a coal fire giving 20 per cent efficiency. This will mean that only 6,000,000 B.t.u. are usefully employed. Take the same coal and convert it into gas at 75 per cent efficiency—will give 22,500,000 B.t.u. Gas heat equivalent to nearly 17,000,000 B.t.u., or about three times more than the coal fire.

Along the same line of estimate, the increased yield of gas per ton of coal will, in comparison with solid fuel, greatly enhance the use of gas for industrial work.

Reduce Amount of Coal Needed

Viewing it from another aspect, we can see that it will require only about one-third of the coal with this new process to get the results as compared with the old systems. Surely one cannot fail to realize the immense saving that will accrue with the lesser amount of tonnage to be transported by the Railways, and again handled at the plant.

As an instance, let me quote the engineer of the Oldham Corporation Gas Committee. "Some four years ago the company started with a stock of 30,000 tons of coal in October, and finished up with 2,000 tons in April. The year following they began with 20,000 tons and finished again with 2,000 tons. The next year they started with 9,000 tons and the quantity sufficed to carry them over the same period of operation and gave perfectly good results in the quality of gas distributed. From that date on (March, 1920) entire satisfaction has been afforded the consumers with a gas of between 400 to 408 B.t.u. per cubic foot." It may be well to mention that in the Oldham area, with a population of 250,000 people, there are some 700 to 800 mills and workshops, over 400 gas engines, 56,000 gas meters, 25,000 gas cookers, about the same number of gas heaters, 7,000 public gas lamps, and a large number of gas furnaces, water heaters, etc. All told, 242 miles of gas mains with a consumption of 1,500 million cubic feet per annum. If a town of this size can give satisfaction, I feel sure it can be done in any city in the United States.

Besides Oldham, such cities as Manchester, Nottingham, Sheffield, Huddersfield and several of the smaller towns are working more effectively, recovering much greater quantities of heat units from their coal than formerly. Hence you will notice that we are treating with prevailing facts on a large scale, and not propounding any theories or nostrums.

United States statistics would indicate that last year the coal gas plants used about 9,000,000 short tons of bituminous coal. Imagine what it would have meant to have cut this quantity to one-third and still have arrived at the same results, or on the other hand to have taken this coal and obtained two and a half or three times the amount of heat units that probably were obtained.

From a monetary standpoint, let us take this illustration. Under a system making 12,500 cu. ft. of 500-B.t.u. gas per ton, with by-products, about 6,000,000 B.t.u. are produced. To obtain 30,000,000 B.t.u. on this basis, five tons of coal, costing, say, $30, would have to be bought. A vertical retort system with charge steaming, making 10,000,000 B.t.u. per ton would only require three tons of coal, costing $18, with the value of the by-products to be deducted.

With complete gasification and a make of 22,500 000 B.t.u. per ton means that one and one-thirds tons of coal per 30,000,0000 B.t.u., costing only $8, is required. In all these figures, it is to be remembered that we have still left to the credit of the complete gasification system, the reduction in costs of labor, smaller investment for storage and coal handling

Horizontal retorts, vertical retorts, steaming vertical retorts and complete gasification of coal.

These figures were submitted by E. H. Hudson, of Normanton, England, before the last meeting of the Manchester District Institution of Gas Engineers, after he had concluded to install a Tully carbureted hydrogen plant:

One ton of coal on the basis of 14,000 B.t.u. per pound equals 3,360,000 B.t.u.

	Make of Gas Per Ton —Cu. Ft.	Values In B.t.u. Per Cu. Ft.	B.t.u. Multiple Per Ton	Yield of Gaseous Fuel Per Cent	Coal Handled Per 100,000,000 B.t.u.—Tons
Horizontal retorts	11,500	500	5,750,000	18.3	17.3
Vertical retorts	12,500	500	6,250,000	19.9	16.0
Steaming vertical retorts	18,411	462	8,505,882	27.1	11.7
Complete gasification of coal	55,750	400	22,300,000	71.0	4.4

machinery, with a probable elimination of the coke handling entirely.

From question four it should not be inferred that we propose any immediate specific way by which the complete gasification of coal should be attained, for in most cases the necessary modifications to existing equipment will have to be performed gradually.

However, as standards are reduced to meet this process of gas manufacture, present machinery will be supplemented with apparatus that will permit distillation and gasification of the coal in a single shell. Or, as some of the patentees of such processes have termed it, the gasification of coal with the production of water gas in the same plant at the same time."

As a matter of fact, most of these plants are so built that one can make blue gas, a mixture of coal and water gas, carbureted water gas, producer gas, or a mixture of producer gas and coal gas in the same machine.

This is not spoken of at random, as there is ample justification for a preference of such type units confirmed from the number of installations that have already been made in England, and on the continent of Europe, besides the great number that are now under negotiation.

All of these systems differ in some constructional points one from the other. Most of them are built to run in single units or tandem.

Production figures covering periods of twelve months' continuous operation and longer proclaim yields of 50,000 to 60,000 cu. ft. per ton of coal of 400 B.t.u. gas.

At the Grantham Gas Works, with a Tully plant of 300,000 cu. ft. daily capacity, the results with all coal working gave an average gas yield per ton of 54,000 cu. ft. of 425-B.t.u. gas with total inerts below 12 per cent. Both coking and non-coking coals, some of them with as high a content as 50 per cent ash, were run through this plant. The non-coking coals were found to give more satisfactory results. The yield of tar would appear to be about the same in quantity as in ordinary working, but is more of an emulsion of a higher percentage of water than the usual coal gas tar. The quantities of ammonia were almost negligible and the only liquor that has yet been obtained showed less than 0.5 NH_3.

Before closing on the fourth question, permit me to include a chart showing the comparative costs of producing B.t.u. by four different processes, viz.:

It is assumed in the above estimate that the steam required for the generation of water gas is developed by the waste heat from the settings.

It is reasonable to expect that these figures will be challenged by the adherents of coal carbonization with by-products. Nevertheless, we are gas makers first, and the gas industry is going to sell B.t.u.'s in the future. Secondary products must be sacrificed or at any rate, in part, if this policy will promote our industry and make towards establishing itself on still more unassailable heights in respect of economy, efficiency in use, and labor saving.

The decision will rest on the balance sheet with as a persuading factor in the position the recognition that our strength in competition is in gas, and in the price at which we can sell heat energy at a fair profit.

If personal opinion is to account for anything, I dare say that from past experience, and taking the consensus of opinion of a majority of the gas works operators, by-products in the final analysis brought us a very small margin of profit, if any. The extra equipment, wear and tear, the overhead in handling and sales, the distribution, etc., all made it a questionable proposition when balancing up both sides of the ledger.

If the complete gasification of coal can be achieved in one operation with results as have been proven it is more to the point to go ahead and work to this end than worrying how gas can be reduced another penny or so per thousand cubic feet by trying to recover some by-products.

We will have with us for all time in the future, and I believe in greater number, the by-product coke and gas plant, the various processes of low-temperature carbonization in the one or two stage methods, and we can readily leave it to these gentlemen to take care of the coke, tar, oil and ammonia markets.

In this regard, my remarks can be reinforced by telling you that in the late war the gas plants supplied only about 8½ to 9 per cent of the benzol and toluol that went into munitions manufacture; the balance came from other sources, better equipped for this class of work.

Advancing in this direction will eventually lead us to the same procedure of selling our product—that is on a heat unit basis—as has been adopted under the gas regulation act in England.

By this time I assume you may have observed that my "Forethoughts" are not forethoughts after all (except probably locally) for I have cited to you no brand-new innovations but have been presenting to your attention actual performances over a period of nearly two years.

When this paper was started it was my desire to include a few notes pertaining to some improved methods of purifying gas, but having devoted considerable more space than at first anticipated to the subject of lower B.t.u. gas, and which I regarded a decidedly more vital theme at this moment, we will have to let the other matter go by simply saying that in this direction also lie ways and means for improvement.

The use of centrifugal type machines for tar removal, etc., the application of catalytic processes, the precipitation of impurities by accelerated chemical reactions, either by a dry or a wet method, will, I am positive, at a future date reduce our gas condensing, scrubbing and purifying plants to one-half, or even one-third of the building area that is now required for them, thus saving in capital expense, labor, etc.

It is to be hoped that these remarks will bring forth new thought and vigorous action among the gas engineers and designers of gas plant machinery. And that gas companies will co-operate with and stimulate the new ideas by gradually adopting and introducing the new processes as best suited for their respective needs.

It may appear strange, but whatever improvements have been made to gas plant machinery, have almost all, with few exceptions, dealt with the mechanical side of a problem. There must be more study given to the chemical and thermo-chemical side of gas manufacturing processes.

Every plant operator should, from time to time, do some research work on his own initiative that will ultimately aid in bettering gas manufacturing methods.

We must keep ahead of the art, and I express the hope, and it is not amiss, if we are to follow our confreres in the chemical industries—and gas manufacturing is a part of them—that by the time of the next meeting of the Southern Gas Association will have taken steps to establish a chair of gas engineering and fuel research at one of the larger Southern universities. Such action, I can say without hesitation, will render to you and all concerned, an incalculable amount of benefit, especially as we advance into the future, replete with its many problems and difficulties. Besides opening the way for young men to be more properly trained for the duties that devolve upon them when becoming plant operators.

What research has done for other industries it can do for ours. Here is what Dr. Charles L. Reese, chemical director of E. I. du Pont de Nemours & Co., has to say about research of his company, that besides monetary gain it resulted in increased safety of employees, enabled the company to keep ahead of the art, reduced selling prices of established products in spite of increased cost of labor and raw materials, increased output, discovered new products, the benefits of which often added to the safety, comfort and happiness of the people of the country, conserved materials, and advanced the art in a few years equivalent to fifty years of normal experience.

The gas industry has only lately proven what an important factor it has been in the existence of our people. Materials derived from our operations went into the manufacture of high explosives during the recent war. We were represented not only by the shot and shell on the line of battle, but equally, if not benignantly were we assisting indirectly behind the lines in the ministrations to wounded, friend and foe alike, by the many medicinal palliatives that are primarily obtained from ordinary gas works tar.

We must demand our rightful place in the category of the great essential industries of America, for among them we stand pre-eminent.

Perplexing and harassing as the problems have been, I will reiterate again that our only solution lies in setting up a united front against any and all regulative measures that may be putting a strangle-hold upon our legitimate development, thereby injuring not only the interests of every human being in this country, but jeopardizing one of the greatest national safeguards as well.

Accounting Section, A. G. A., Busy

A well-attended meeting of the managing committee of the accounting section was held at Association Headquarters May 12 at which progress in the preparation of the section's program for the 1921 convention was discussed.

The papers committee reported definite arrangements consummated for three of the items on their program, which will include such subjects as the Federal income tax, form of monthly production statement, personnel in utility companies, etc. A feature of the section's 1921 program will be the setting aside of one entire afternoon as an open forum to discuss:

General accounting subject of interest to the members or specific problems they are confronted with in their work.

Suggestions of members as to subjects to be included in the accounting section program for 1921-1922.

An endeavor will be made to have this session as informal as possible and it is hoped that representatives of smaller gas companies will take occasion to introduce for discussion the problems peculiar to companies of their size.

Progress was also reported in the preparation of committee reports and E. C. Scobell, chairman of the committee on fire insurance rates presented a form of questionnaire to be distributed to all member and non-member gas companies.

The information received as a result of this questionnaire will be compiled in such a way as not to indicate its source and be made available through the committee's report to all gas companies seeking reductions in their present fire insurance rates.

That such rates are too high at present was indicated by the discussion of the paper on insurance practice presented by J. G. Reese of Baltimore, at the last convention.

It was also indicated that little relief from present rates could be expected unless authentic statistics as to fire losses over a period of years and covering a sizable proportion of the industry could be presented to the underwriters. It is hoped, therefore, that replies will be promptly and fully by all gas companies to the questionnaire.

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company	Issue	Maturity	—Market— June 9, 1921 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	89	89½
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	77	78½
Columbia Gas & Elec. Co.	First 5s	Jan. 1, 1972	83	84½
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	96	96½
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	73	74
Consol. Gas Co. of New York	Sec. Conv. 7s	Feb. 1, 1925	100⅜	100⅝
Consol. Gas Co. of New York	One Year Sec. 8s	Dec. 1, 1921	99⅞	100⅛
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	61½	63
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	80	82
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	90	92
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	95	98
Hudson County Gas Co.	First 5s	Nov. 1, 1949	74	76
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1934	73½	75
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	94	95
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	68	71
Milwaukee Gas Light Co.	First 4s	May 1, 1927	81	82
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	76⅝	77
Pacific Gas & Elec. Co.	Col. Tr. Conv. 7s	May 1, 1925	96½	97
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	98	99
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	86	87
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	72	73
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	75	76½
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	74	75½
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	65	68
Southern California Gas Co.	First 6s	Nov. 1, 1950	82½	85
United Gas Improvement Co.	Two Year 8s	Feb. 1, 1923	97¾	98¼
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	76	78
Washington Gas Light Co.	General 5s	Nov. 1, 1960	77½	79
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	73	75

Installs Oil Tanks

Poughkeepsie, N. Y.—The Central Gas & Electric Company has announced its intention of ordering immediately two large oil storage tanks to hold about three-quarters of a million gallons of gas oil. This will, it is believed, result in the reduction of present gas rates and enable the company to take advantage of the present oil market in which oil can be purchased at low rates owing to overproduction and decreased consumption during the present industrial depression. It is expected that the tanks will be ready for the storage of oil some time in July.

A similar opportunity to secure tanks has not been offered in the past owing to excessive cost of storage tanks and to the fact that oil prices under contract and in the open market showed no great variation. Oil companies refuse to quote prices for a year's supply except at rates high enough to protect them in a rising market later in the year when industry is expected to revive.

Statistics from Public Utilities Commission

Columbus, Ohio.—The 1920 report of the State Public Utilities Commission, issued May 27, shows:

That many natural gas companies in Ohio were authorized to abandon service because the available supply is rapidly diminishing.

That the electric light and power industry is expanding rapidly, evidenced by a big increase in number of customers, new plants and property investment.

That relief must be afforded interurban railways soon or there will be a general abandonment of service, evidenced by the fact that almost half of the interurban companies in the State operated at a loss.

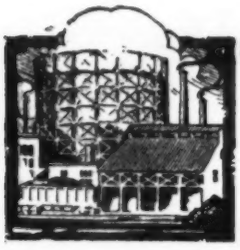
An increasing demand for gas is indicated, however, by an increase during the year in the number of customers from 893,393 to 926,820. While the total property investment in the natural gas industry increased from $276,661,881 to $323,535,005, the gross receipts of all natural gas companies fell from $67,363,574 to $66,795,331.72.

150 Unions Protest

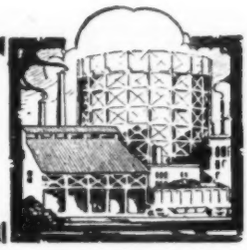
Philadelphia, Pa.—Protest against favorable action on the recommendations of the mayor's special commission on the United Gas Improvement Company was made recently by the legislative committee of the Central Labor Union in a letter to city councilmen.

"We see no reason," the protest says, "for the change of standard, nor an increase in the price of gas at this time as a further burden to increased taxation and in the face of decreases in the income of a great majority of consumers.

"We voice this protest of the members represented by this body, approximately 225,000, of 150 local branches of labor organizations, all voting citizens of Philadelphia, and we feel also that the sentiment of the entire gas consuming citizenry is herein voiced."



NEWS OF THE GAS INDUSTRY



Choose Association Officers

Savannah, Ga.—After the most largely attended and successful convention in its history, the Southern Gas Association concluded its fourteenth annual meeting here June 2. Officers were elected as follows: L. I. Pollitt, of Baltimore, president; H. E. McDonald, of Greenville, S. C., first vice-president; A. W. Young, of Knoxville, Tenn., second vice-president; G. H. Smith, of Baltimore, secretary-treasurer.

Directors elected for two years were: E. L. Reiha, Baltimore; J. J. Conlin, Charlotte; J. W. Golden, Savannah, and B. W. Bean, of Washington. The next convention will be held at Greenville, S. C., May 16, 1922. Papers and addresses by New York experts and discussions of technical points in the gas business completed the program, and a boat ride and dinner concluded the entertainment features of the convention.

Union Pacific Railway Is to Enter Wyoming Oil Fields

Gossip has it that the Union Pacific will extend its road from O'Fallons, on the main line, to Haig, near the western boundary of the State of Nebraska.

The purpose, it is said, is to extend the Haig branch to a connection with the Chicago & Northwestern Railroad, possibly at Crawford, and then, by an operating agreement with the Northwestern, reach Casper, the main shipping point of the great oil region.

With its present trackage the Union Pacific participates in but little of the oil and other developments in Wyoming, aside from the tier of counties adjoining the southern border of the State now traversed by its lines.

The extension of the Haig branch to Casper will enable the Union Pacific to tap the fast developing counties of Goshen, Niobra and Natrona, the latter the richest oil center in the State.

Federal Court Restrains Local nterference

Owensboro, Ky. — Judge Walter Evans in Federal Court in Louisville granted the temporary injunction asked in the petition of the Kentucky Public Service Company to prevent the city from reducing the gas rate from $1.40 net to $1.15, as provided in the ordinance of March 21. Mayor John C. Calhoun was enjoined from issuing any proclamation to the people of the city not to pay their gas bills at the rate of $1.40.

By the order of the court the company wins the first round of the fight in which it is seeking to prevent the city from reducing the rate charged for gas here or fixing any rate which is not sufficient to give the company a reasonable return on its investment. The real test will come later, however, when the hearing on the permanent injunction takes place. Judge Evans indicated that this hearing would not be held before the fall, as all his time is taken up until the summer vacation.

By the order of the court the gas company is directed to furnish $10,000 bond and prepare receipts to be given to all consumers for the difference between the rate allowed by the injunction and the rate fixed by the city. The company must comply with these provisions of the order within the next ten days. It will collect at the rate of $1.40 net per 1,000 cu. ft. for the gas furnished consumers, but if the temporary injunction is not sustained in the hearing on the final injunction later on, the difference of 25 cents is to be refunded to consumers.

The city through its attorneys, Louis Igleheart and Ben D. Ringo, filed its answer in the case before the court, together with various affidavits supporting its contention that the value of the local plant has been exaggerated by the company, and that the company has a binding contract under its franchise to furnish gas in this city at the rate provided in the city ordinance. Argument of the case was not entered into at all, as the court after hearing the presentation of the case by each side decided to grant the temporary injunction to hold until the entire case is thrashed out at permanent injunction hearing. The gas company had affidavits and a New York expert on hand to support its claims, but the court would not allow the expert to be heard.

Gas Companies Pay Taxes

New York, N. Y.—Controller Craig has announced that payments aggregating $2,232,351 had been made by gas and electric companies as a result of the sales of tax liens on their properties.

After the city had bought in the liens the following companies, it was announced, settled bills as follows: Consolidated Gas Company, $876,175; New Amsterdam Gas Company, $234,951; New York & Mutual Gas Company, $124,104; Standard Gas Light Company, $122,586; Mutual Gas Light Company, $253,483; New York Edison Company, $494,085; United Electric Light & Power Company, $117,964. The total amount collected by the city in taxes in the last four days, Controller Craig announces, was $2,232,351.03.

Will Erect Holder

The Stacy Manufacturing Company, of Cincinnati, was awarded contract by the board of commissioners of the city of St. Petersburg, for the construction at St. Petersburg, Fla., of a 1,000,000 cu ft. capacity gas holder, to be completed by fall.

Visit Gas Plant

Providence, R. I.—The weekly meeting and luncheon of the Rotary Club was held at the plant of the Providence Gas Company being attended by about 100 members. The trip was made in automobiles, luncheon being served upon arrival. After luncheon the members were taken through the plant.

Extensions Being Made

Atlanta, Ga. — The progress of general improvements undertaken by the gas department of the Georgia Railway & Power Company is noted in a statement given out by President P. S. Arkwright, with a review of the equipment already installed and the improvements in service.

The statement follows:

"In the coal-gas plant eleven benches have been overhauled and a new charging machine, a waste-heat boiler, a new standpipe system and two coal-gas exhausters have been installed.

"A new water-gas machine, valued at $60,000 and having a daily capacity of 3,000,000 cu. ft., is now being set up. Two 250-h.p. motor blower sets for water gas, a new Thomas meter, a Doherty washer-cooler for purifying and condensing water gas, and one cylindrical and two rectangular purifiers have been put in.

"Two Ingersoll-Rand compressors have been installed and are being used to force gas to the College Park and East Point sections. To force gas throughout East Atlanta, Druid Hills, Decatur, West End and Ansley Park sections, two De Laval steam turbine pushers have been put in. The installation of a skip hoist ash conveyor and new ash screens has been completed.

"For increasing gas pressure in the central and Grant Park sections, a new low-pressure booster is now in operation.

"A new two-story concrete building is nearly completed. The first floor will accommodate the compressors and pushers, the second will contain a modern locker room, with showers, for the use of employees.

"Other proposed new installations are as follows:

"For transforming pressure, governor stations will be provided at several locations. There are three kinds of pressure used in supplying gas to consumers: low-pressure, where only a few ounces are employed; intermediate, with about 5 lb., and high-pressure, with a maximum of 50 lb.

"The intermediate pressure system at North Avenue and Bedford Place has been extended to supply the Virginia Avenue and Highland Avenue sections. In the West End the intermediate pressure installation is nearly completed.

"Trunk mains are being extended to improve the pressure in the Grant Park section.

"A 10-in. main is being extended from Boulevard Park to Piedmont Avenue and from Piedmont Avenue to the end of Ansley Park, to increase the pressure in the extreme northern end of Ansley Park.

"Part of the gas-main system on the west side of Lullwater Bridge in the Druid Hills section is being transformed from low pressure to intermediate. This change requires the laying of a 12-in. main in North Decatur Road from Lullwater Road to Briarcliff. A governor station will also be installed. This will increase the gas pressure in all of the Druid Hills section west of Lullwater Bridge and north of Ponce de Leon Avenue.

"When completed all sections of the system will be benefited by these installations. In order to raise the standard of service to the highest point possible, appropriations have been made far in excess of those necessitated by the rulings of the railroad commission. The total amount already spent, or contracted for, amounts to $540,000."

Clearwater May Have New Plant

Clearwater, Fla.—At the regular weekly meeting of the board of governors of the Clearwater Board of Trade it was decided to call a meeting of the board of trade, together with other citizens, to discuss the advisability of having a gas plant for Clearwater. Owing to progress of the city it was thought necessary for such a plant to be established and that it would be of untold benefit to the residents. There will be several other important matters discussed at that meeting.

Increase Allowed

Madison, Wis.—The gas rates of Appleton, Neenah and Menasha were ordered boosted by the State Railroad Commission 25 cents per thousand feet when the gas company makes improvements ordered by the commissioner. The rate is now $1.45 per thousand.

Change of Address

The Combustion Engineering Company announce their removal from 11 Broadway to their new building at 43 Broad Street, New York. Their Philadelphia, Pa., office is now located in the Finance Building, and is under the management of W. C. Stripe.

Sharon to Pay for Gas

Sharon, Pa.—Sharon will have to pay $3,482.50 for gas used by the city during the period Jan. 1, 1919, April, 1921, according to a recent decision of the State Supreme Court.

When the gas company entered Sharon the franchise provided free gas. However, the recent ruling held this unlawful and now Sharon has to pay for its gas.

At the council session several transfers of money from one fund to another were made to take care of part of the debt.

Reduces Rates

Omaha, Neb.—A reduction in the price of gas was agreed upon informally by the board of the metropolitan utilities district recently.

The reduction will go into effect on July consumption. The price of gas now is 75 cents for the first 500 ft; $1.45 a thousand for the next 2,000 ft.

The new price will be 75 cents for the first 500 ft.; $1.35 for the next 2,000 ft.

This 10-cent reduction, according to R. B. Howell, manager of the utilities district, will mean a reduction in revenue of $100,000 a year.

Brooklyn Borough Gas Has Resumed Dividend

Brooklyn Borough Gas Company has resumed payments to shareholders by the declaration of a 6 per cent dividend. Although official announcement was made June 2, it is learned that the directors declared the dividend a fortnight ago. Checks were mailed from Philadelphia as the dividend was payable on June 1.

This dividend is the first paid since 1916. The company paid 3 per cent in 1913 and 6 per cent annually from 1914 to 1916.

Gas Users Complain

Brooklyn, N. Y.—Alleging that the $1.50 gas rate charged by the Kings County Lighting Company was "unreasonable and excessive," the Boro Park Community Welfare Association has complained to the Public Service Commission and asked for relief. The Kings County Lighting Company, along with eighteen other gas corporations, has been notified to appear on June 16 before the commission to justify their charges.

Increased Rate Allowed

Trenton, N. J.—The New Jersey Gas Company, which serves numerous communities in Camden, Gloucester and Salem Counties, has been given authority by the Public Utility Commission to put into effect a base rate of $2.10 net per 1,000 cu. ft. Authority was given the company to charge $42 a year for each street light, which is owned by a municipality or by private parties, in which approximately 5 cu. ft. of gas is consumed per hour between dusk and dawn of each day. With respect to the base rate of $2.10, which is for metered service to all customers, the board orders put into effect a block system of charges. The base rate is to be charged for the first 25,000 cu. ft. For each additional 25,000 cu. ft. of gas consumed the rate is reduced 5 cents, so that up to the fourth block the rate will be $1.95.

For the next 100,000 cu. ft., in two equal blocks of 50,000, the charge is to be $1.75, and for the next 300,000 the price drops on the last block to $1.60. The schedule thereafter provides that the rate for all gas consumed in excess of 500,000 shall be $1.55 a thousand.

Because of the complaints of poor service in the Laurel Springs district, where the company was ordered last November by the former Utility Board to increase the capacity of its mains to provide proper gas service, the Utility Board orders that the consumers in this territory be allowed a discount of 10 cents a thousand cubic feet from the block schedule of rates before enumerated, until such time as the company completely complies with the terms of the November order.

The New Jersey Gas Company was given authority on July 20 of last year to make its base rate for metered service $1.91 per 1,000 cu. ft., which is now increased to the $2.10 rate. It has also been charging 25 cents a month for its readiness to serve and this is to be discontinued by the action of the Utility Board to-day.

The company asked for a base rate of $2.60 per 1,000 cu. ft. for the retail service, $1.65 for the industrial service, and the $42 rate for the street lamps, which was allowed by the board's decision.

Glassboro, Gloucester, Center, Laurel Springs, Clementon, Wenonah, Lantua, Woodbury Heights, Glendoro, Clayton, Pitman and Woodstown, are some of the communities affected by the new rate. They were also represented at the hearings on the matter before the Utility Board, as was also the Federation of Civic Associations of Camden County.

The report of the Utility Commission did not carry authority for the company to include in its rates the $1.65 per 1,000 cu. ft. charge for industrial service.

In its application for authority to advance its rates, the company set forth that the manufacture of gas has greatly increased over the prices prevailing in 1918 when it was allowed a base rate of $1.65. In valuing the company's property in 1916, for rate-making purposes, the board fixed $1,141,619 as the worth of the property, refusing to allow certain items representing excess equipment in capacity not then necessary for the proper service of the company's customers. This equipment was estimated at $88,671. The company in its application of last November for the increase passed upon to-day set forth that this excess equipment is now in use, thus increasing the property valuation for rate purposes.

In reaching its conclusions to-day the Utility Board refused to grant the full estimate of the excess equipment. It did find that it is being used to the extent of $34,413, which added to the other estimates of the company's property made as of Dec. 31, 1920, fixes the present valuation at $1,373,500.

After filing its application for the $2.60 rate for metered service, Norman Grey, counsel for the company, April 15 last asked the Utility Board to give his client any rate which in its judgment would provide the company an 8 per cent return on the capital invested.

"In its original proofs asking for a base rate of $2.60," said the Utility Board to-day, "the company based its application on the costs prevailing in the month of October, 1920. The costs of fuel and oil have considerably changed since that time. It will, therefore, be necessary, in order to determine just and reasonable rates for all classes of service, to prepare an estimate of the costs for the coming year based on prices expected to prevail during the next twelve months. The testimony in the case indicated that expenses for the coming year (except with respect to fuel and oil) will very closely approximate those during the calendar year 1920."

Prices of materials at different dates are then given for anthracite and bituminous coal, coke, gas oil, labor and taxes. Fluctuations are indicated in the first four, with steady increases being shown in the last two.

"The applicant asks that the board allow it an 8 per cent return on the fair value of its property devoted to the public use," comments the decision in this connection. "In view of the fact that the prices as revealed by the record in this case are in a period of transition and that the trend is distinctly downward, the board will allow as a fair return on the use of the property of the company the amount of net revenue derived by the applicant from its operations in 1916. This net revenue approximated $90,000 and the board determines that $90,000 is the fair net revenue to be derived by the company for the use of its property for the ensuing year."

Because of popular objection to the fixed service of 25 cents which the company has been charging, the Utility Board stated it would calculate the new schedule of block rates omitting this charge. In fixing the block system, the board said that every consumer would be treated alike in the matter of rates without any arbitrary distinction between domestic and industrial consumers.

Would Bond Extensions

Detroit, Mich.—The Lansing Fuel & Gas Company has applied to the Michigan Public Utilities Commission for an increase in valuation of approximately $600,000. The present valuation is $2,175,000. The company is bonded for $1,653,000 and has outstanding notes of $150,000, according to the figures submitted to the commission. The first bond issue of $910,000, due April 1, has been extended for ten years at 7 per cent. The second issue is of $743,000, due Oct 1, 1927, and draws 5 per cent. The outstanding capital stock is $700,000, a greater part of which is owned by C. E. Geist, president. The company wishes to issue more bonds for extensions, and to do so says it must decrease its indebtedness in the form of notes.